

CLAIMS

What is claimed is:

1. An improved drive circuit for a DC motor, comprising:
 - a DC power source;
 - a relay having a normally open contact and a normally closed contact;
 - a DC motor electrically connected to the power source through the normally open contact of the relay; and
 - a discharge circuit arrangement having a switched solid state device and coupled to the normally closed contact of the relay, the discharge circuit arrangement operable to inhibit current flow from the DC motor until the relay is in a normally closed contact position.
2. The improved drive circuit of Claim 1 wherein the discharge circuit arrangement includes a delay circuit and a discharge circuit path, where the delay circuit controls an operational state of the switched solid state device using energy stored in the DC motor.

3. The improved drive circuit of Claim 2 wherein the switched solid state device is disposed in the discharge circuit path and operable to discharge current flow from the DC motor when the relay is in the normally closed contact position.

4. The improved drive circuit of Claim 2 wherein the delay circuit operably delays the discharge of current flow through the switched solid state device until the relay is in the normally closed contact position.

5. The improved drive circuit of Claim 2 wherein the delay circuit is comprised of a resistor and a capacitor coupled in series.

6. The improved drive circuit of Claim 1 wherein the switched solid state device is selected from the group consisting of a silicon controlled rectifier, a triac and a transistor.

7. The improved drive circuit of Claim 1 wherein the switched solid state device is further defined as a field-effect transistor.

8. An improved drive circuit for a DC motor, comprising:

- a DC power source;
- a relay having a normally open contact and a normally closed contact;
- a DC motor electrically connected to the power source through the normally open contact of the relay; and
- a discharge circuit arrangement having a switched solid state device and coupled to the normally closed contact of the relay, the discharge circuit arrangement is operable to control an operational state of a switched solid state device using energy stored in the DC motor.

9. The improved drive circuit of Claim 8 wherein the switched solid state device is operable to discharge current flow from the DC motor when the relay is in the normally closed contact position

10. The improved drive circuit of Claim 8 wherein the discharge circuit arrangement includes a delay circuit and a discharge circuit path containing the switched solid state device.

11. The improved drive circuit of Claim 10 wherein the delay circuit operably delays the discharge of current flow through the switched solid state device until the relay is in the normally closed contact position.

12. The improved drive circuit of Claim 10 wherein the delay circuit is comprised of a resistor and a capacitor coupled in series and the switched solid state device is further defined as a controlled rectifier, such that a gate terminal of the rectifier is coupled between the resistor and the capacitor.

13. The improved drive circuit of Claim 8 wherein the switched solid state device is further defined as a field-effect transistor.

14. An improved drive circuit for a DC motor, comprising:

- a DC power source;
- a relay having a normally open contact and a normally closed contact;
- a DC motor electrically connected to the power source through the normally open contact of the relay; and
- a field-effect transistor having a drain terminal, a source terminal and a gate terminal, where the drain terminal is coupled to the normally closed contact of the relay.

15. The improved drive circuit of Claim 14 wherein the field-effect transistor is operable to discharge current flow from the DC motor when the relay is in a normally closed contact position

16. The improved drive circuit of Claim 14 further comprises a control circuit coupled to the normally closed contact of the relay and operable to delay the discharge of current flow through the field-effect transistor until the relay is in the normally closed contact position.